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Similarity in depressive symptom profile in a population-based study of migrants in the Netherlands

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Abstract
Objective Depression is a clinical syndrome developed in Western Europe and North-America. The expression of symptoms and the impact of symptoms on functioning may therefore be expected to vary across cultures and languages. Our first aim was to study differences in depressive symptom profile between indigenous and non-Western immigrant populations in the Netherlands. We hypothesized that differences in expression of depressive symptoms would be more likely in the domains of mood and cognitions, and less likely in the domains of psychomotor and vegetative symptoms. Our second aim was to study ethnic differences in the association of depressive symptoms and general functioning.
Method In a random community sample stratified for ethnicity in Amsterdam, the Netherlands, depressive symptoms were assessed by bilingual interviewers using the Composite International Diagnostic Interview (CIDI 2.1) and the Symptom Checklist-90-Revised (SCL-90-R). Impairments in functioning were measured by the World Health Organization Disability Assessment Schedule II (WHODAS II). Results were obtained from 812 subjects: $N = 321$ native Dutch, $N = 213$ Turkish-Dutch, $N = 191$ Moroccan-Dutch, $N = 87$ Surinamese-Dutch. Differences in depressive symptom expression were tested by differential item functioning.
Results The prevalence of DSM-IV depressive disorder and the overall level of depressive symptoms were higher in the Turkish and Moroccan immigrant groups compared to native Dutch subjects. Ethnic differences in item functioning of depressive symptoms were rare, and equally unlikely in all four symptom domains. Depression was equally associated with functional impairment across ethnic groups.
Conclusion Although depressive symptoms were more common among migrants than in the indigenous population, both the depressive symptom profile and the associated functional impairments were comparable. These findings may help diminishing concerns about the validity of using existing diagnostic procedures among ethnic minority groups.

Keywords Depressive disorder · Disability · Cross-cultural comparison · Turkey · Morocco

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Introduction

This study focuses on the clinical characteristics of depressive symptoms and major depressive disorder in immigrants in the Netherlands. Extensive epidemiological research, pioneered by the WHO, has confirmed the assumption that depressive disorder is a medical condition occurring worldwide [34, 48]. However, cross-cultural psychiatrists have alerted us to cultural variations in depressive mood, symptoms and illness [e.g., 25, 26]. Kleinman and Good [27] caution that "'Dysphoria'—sadness, hopelessness, unhappiness, lack of pleasure with the things of the world and with social relationships—has dramatically different meaning and form of expression in different societies." The most recent psychiatric diagnostic classification system, the Diagnostic and Statistical Manual (DSM)-IV, is criticized for its universalistic nosological assumptions [30]. Moreover, the culture of immigrants is not static, but changing as a result of individual and group acculturation to the host society. This will influence the risk factors and prevalence of depression [12, 14].

The socio-demographic situation in the Netherlands offers an outstanding possibility to study this question of similarity versus diversity of depressive symptom profile. In the second half of the former century, immigration into the Netherlands increased. The three major immigrant groups came from Turkey, Morocco and Surinam/The Netherlands Antilles. The newcomers pose challenges for the health care system in general and mental health care in particular. This is understandable as far as practical obstacles are involved, like lack of fluency in Dutch language or insufficient knowledge of the Dutch health care system. However, even beyond these barriers doctors experience difficulties in diagnosing and treating immigrant patients. Clinicians frequently argue 'how different' mental disorders are expressed in these patient groups. In our study we focused on the clinical characteristics of depressive disorder in immigrants compared to native Dutch subjects, and investigated the cross-cultural variation of depression in two ways. Firstly, we explored cross-cultural differences in depressive symptom profile. Secondly, we examined if the depressive symptoms are associated with different levels of impairment in the immigrant groups.

To date, there is much debate about the clinical characteristics of depressive disorder. The definition of major depressive disorder in DSM-III and newer editions has been criticized for lumping together different diseases, syndromes or even normal reactive states [33]. Factor-analytic studies of measurement instrument have been performed to identify common dimensions of depressive symptoms. Shafer [35], for example, found in a meta-analysis of four depression questionnaires (Beck, CES-D, Hamilton and Zung) three factors shared by all tests: 'general depression', 'somatic symptoms' and 'positive symptoms'. However, the tests showed substantial variability in items defining the 'general depression' and other factors. Because this exploratory research is inconclusive, several alternative models have been proposed, both for depressive, as well as for anxiety disorders [36], but up to now no consensus has been reached on the best model. As a framework for our hypotheses on cultural variations in symptom profile we opted to use the traditional clinical classification of the symptoms of depressive disorder in four domains: mood disturbances, psychomotor disturbances, cognitive disturbances and vegetative disturbances [4]. In fact, this classification reflects the different aspects of the psychiatric status examination. Each domain describes a different *type* of symptoms. Cultural elaborations can be expected to differ in their impact on each of these symptom domains: Mood disturbances can be difficult to verbalize and might readily be expressed in specific, local idiom [6, 11, 27]. As Kirmayer [25] outlines, universal basic emotions may give rise to metaphorical elaborations. Bhugra and Mastrogianni [13], in an extensive review of globalization and depression, gives several examples of these 'idioms of distress'. We hypothesized that the contribution of mood symptoms to the depressive symptom profile is lower in the three immigrant groups. Cognitive symptoms can be expected to vary across cultures, depending on the type of society, and are influenced further by migration and acculturation experiences [6, 11, 12, 14, 17, 25, 27]. Therefore we hypothesized cognitive depressive symptoms to vary distinctively across immigrant groups and native Dutch subjects. Notwithstanding these social-cultural elaborations of emotions and cognitions, a basic model of a universal bio-psychological vulnerability for depressive disorders is generally assumed [34, 38, 48]. This is called the pathoplastic model, which refers to the cultural modeling or 'plastering' of the manifestations of psychopathology [43]. We hypothesized that the basic psychopathology of depressive disorder would be reflected in equal psychomotor and vegetative symptoms across the ethnic study samples.

Our second research question focused on the impact of depressive symptoms on general functioning. Patients from non-Western backgrounds have been described to underreport as well as over report their depressive symptoms. Underreporting may be due to a number of reasons, like social embarrassment or a tendency to express somatic symptoms rather than emotional distress [13, 25]. In such situations, merely the patients with severe forms of depressive illness will present symptoms. As a consequence, high levels of disability are to be expected in these cases [38]. On the other hand, clinical reports and impressions suggest exaggeration of depressive symptoms by some non-Western

populations. In a British-Turkish comparative clinical study, Turkish depressive patients in Istanbul showed a higher tendency to emphasize symptoms [44]. Moroccan immigrant patients in France have been described to present clinical pictures of 'hypochondriacal depression' verging on malingering [6]. A high tendency to report depressive symptoms has also been suggested as an explanation for the high levels of depressive symptoms found in population studies of Turkish and Moroccan immigrants in the Netherlands [51] and Belgium [28]. Therefore, some clinicians tend to play down the depressive symptoms of immigrant patients. Implicitly it is assumed that the impact of depressive symptoms on daily functioning is less severe in immigrant patients than in native Dutch patients. In this study we investigated the hypothesis that in immigrants groups depressive symptoms are associated with less disability than in the native study group.

We tested our hypotheses on ethnic differences in depressive symptom profile and associated functional impairments in a community sample of Turkish, Moroccan and Surinamese immigrants and native Dutch subjects in Amsterdam, the Netherlands. A population study precludes selection bias of respondents due to selective referral. In a recent study based on the same survey, Fassaert et al. [19] showed ethnic differences in perceived need for mental health care and the extent to which needs were met, although these differences were largely explained by mental morbidity.

Method

Sample and response

The study population was derived from a general health survey conducted by the municipal health service of the city of Amsterdam in 2004. This survey focused on the general Amsterdam population with a special focus on residents from Turkish and Moroccan descent. Migrant status was defined by country of birth outside the Netherlands (first generation immigrants) or country of birth of one or both parents outside the Netherlands (second generation immigrants). Respondents who were born in the Netherlands *and* whose both parents had been born in the Netherlands were considered native Dutch subjects [42]. The sampling frame for the health survey was the population register of the Amsterdam municipality. A random sample of the Amsterdam population (age 18+) was stratified for age and descent ($N = 3{,}937$). The overall response rate was 44.1%. The response was significantly lower among men, and lower in the lowest (18–34 years) age-group. The response was also lower among Moroccan-Dutch citizens (38.7%) than among native Dutch (45.8%) or Turkish-Dutch citizens (49.6%; $P < 0.001$) [3]. The great majority of the respondents was first-generation immigrant (94.6%). First-generation immigrants were more likely to participate in the study than second-generation immigrants in all three migrant groups: 50.7% response in first generation versus 31.9% response ($P = 0.003$) in second-generation Turkish-Dutch immigrants; 39.2% response in first generation versus 27.4% response ($P = 0.035$) in second-generation Moroccan-Dutch immigrants; and 44.4% response in first generation versus 29.6% response ($P = 0.051$) in second-generation Surinamese-Dutch immigrants. After weighting the sample for age, gender and ethnicity, respondents reported an annual income and an unemployment rate comparable to that of the Amsterdam population.

The results presented in this article are based on a second phase of more detailed assessment of mental health in 2005. We limited inclusion to native Dutch subjects and first- and second-generation migrants from Turkey, Morocco and Surinam/the Netherlands Antilles (in the rest of this article summarized as 'Surinam'). Respondents from the first phase who had agreed to participate in the second assessment were invited for an interview at home by bilingual interviewers. Results were obtained from 812 subjects (71.0% response): $N = 321$ native Dutch, $N = 213$ Turkish-Dutch, $N = 191$ Moroccan-Dutch, $N = 87$ Surinamese-Dutch. The response in the second phase showed no selection with respect to age, but was lower among men than women. Response was lower among Turkish-Dutch and Moroccan-Dutch subjects (62.2 and 70.5%, respectively) than among native Dutch subjects (76.9%; $P < 0.001$). Respondents and non-respondents of each of the three migrant groups did not differ significantly in first/second generation status. Differences between respondents and non-respondents in the second phase were tested for several variables that had been assessed in the first phase. No significant differences were found in respondents and non-respondents of Turkish, Moroccan or Surinamese descent with respect to their level of acculturation, as measured with an acculturation scale covering five domains: ethnic self-identification, cultural orientation in the public domain, cultural orientation in the private domain, communication and emancipation. Analyses also showed no significant differences between respondents and non-respondents regarding psychological distress (K10; $P = 0.43$), mental health (MHI-5; $P = 0.07$), care for mental health problems in the past year ($P = 0.91$) and presence of chronic somatic disorders ($P = 0.30$) [46].

Assessments

To minimize misunderstandings due to insufficient mastering of the Dutch language, all respondents were

interviewed by bilingual interviewers matched on gender and ethnicity. Interviews were held in Dutch, Turkish, Moroccan or Berber (a non-written language among Bedouins in western North Africa). All interviewers were trained during a full-time week and intensively coached during the period of data-collection. All interviews were audio-taped. Questionnaires were translated into Turkish, and the key-terms in Moroccan Arabic. After that they were translated back into Dutch. When the translation differed from the original Dutch questionnaire, changes were discussed with the translators and adjusted.

Major depressive disorder was diagnosed by using the Composite International Diagnostic Interview (CIDI), version 2.1, section depressive disorders [49]. The CIDI assesses the nine symptoms mentioned in criterion A of major depressive episode in the 4th edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) [8]. The CIDI is a structured psychiatric interview developed by the WHO for use in cross-national studies. The validity and reliability of the CIDI was shown to be adequate in a number of field trials around the world, including trials in Turkey [47], but not in Morocco. For Turkish speaking respondents the official Turkish translation of the CIDI was used. For non-Dutch speaking Moroccan respondents the official Arabic CIDI translation was used as a source of information to translate the key-terms into Moroccan Arabic. We combined the items on change in appetite and change in weight (E4/E5 less appetite or weight loss and E6/E7 more appetite or weight gain). As a result 17 separate depressive symptom items from the CIDI version 2.1 could be distinguished.

Depressive symptoms were also assessed by the Symptom Checklist-90-Revised (SCL-90-R), subscale depression [16]. The SCL-90-R is a five-point rating scale. In the Dutch adapted edition this scale includes 16 symptoms [9]. The Dutch translation of item 51 ('your mind going blank') corresponds most closely to 'feeling empty'. Although not fully validated in these populations, the SCL-90-R has been used in a number of studies in Turkey [e.g., 5, 21], as well as in Turkish immigrants in Belgium [28]. Up to date, no studies have been published about the SCL-90-R in Morocco, and only one study in Moroccan immigrants in Belgium [28].

We categorized the results on the depressive symptoms of the CIDI and the SCL-90-R in four domains: mood disturbances, psychomotor disturbances, cognitive disturbances and vegetative disturbances [4]. The symptoms were assigned to the four domains at face validity, after careful study of their English and Dutch content. It is noteworthy that psychomotor disturbances refer to abnormalities in movements and facial expression, but also include neurocognitive symptoms like poor concentration, rumination or fatigue. The domain of cognitive disturbances reflects the depressive *content* of cognitions, especially negative evaluations of the self, the world and the future. Some disturbances are covered by more than one CIDI or SCL-90-R item; other aspects are not covered at all. The categorization of the depressive symptom items of the CIDI and SCL-90-R is shown in Table 1.

The impact of health problems on functioning was measured by the World Health Organization Disability Assessment Schedule II (WHODAS II) [50]. The WHODAS II is a general disability questionnaire which contains 36 items, and has six domains: understanding and communicating, getting around, self-care, getting along with others, household and work activities, and participation in society. It has a five-point rating scale, with high scores indicating high levels of disability. The WHODAS II is designed for use in cross-national evaluations. To our knowledge, no studies have been published with the WHODAS II in Morocco, and only one study in Turkey [18].

Sociodemographic information was obtained on immigration age, education in country of origin and in host country, employment status and family income.

Data analyses

Differences in sociodemographic and clinical characteristics between the four study groups (native Dutch, Turkish-Dutch, Moroccan-Dutch, Surinamese-Dutch) were statistically tested using analysis of variance (ANOVA) for the continuous variables and Chi-square analysis for the remaining dichotomous variables. Age of onset was calculated with and without standardization for age. For the SCL-90-R depression subscale a sum score was calculated. All analyses were done with SPSS software [41].

Information on all SCL-90-R depression items was available for 811 respondents (99.9% of the study group). However, as a consequence of the structure of the CIDI interview, the CIDI depressive symptom profile could only be investigated in sufficient numbers of respondents in the subgroups of Turkish immigrants ($N = 119$) and native Dutch subjects ($N = 163$). According to the instructions every respondent is asked about sadness (E1) and loss of interest (E2). If both stem questions are answered negatively, the rest of the depressive items are not administered.

To test whether the ethnic groups differed in reporting of each of the depressive symptoms of CIDI and SCL-90-R, simple statistical testing was unsatisfactory for two reasons. First, the overall prevalence of depressive symptoms differed markedly between the study groups. Second, some symptoms are very common, e.g., worrying too much (SCL-90-R item 31), while others are rare, e.g., thoughts of ending your life (SCL-90-R item 15). Therefore, we studied the performance of each of the depressive symptoms

Table 1 Depressive symptoms from CIDI 2.1 and SCL-90-R categorized in four symptom domains

	CIDI 2.1	SCL-90-R
Mood disturbances		
Depressed mood	E1 feeling sad, empty or depressed	20 Crying easily
		30 Feeling blue
		51 'Feeling empty'
Anhedonia or loss of interest	E2 lost interest in most things	32 Feeling no interest
Psychomotor disturbances		
Movement	E10 talk or move more slowly	–
	E11 have to be moving all the time	
Neurocognitive	E15 trouble concentrating	3 Repeating unpleasant thoughts
	E16 thoughts slower than usual	
	E17 indecisiveness	31 Worrying too much
Subjective	E3 lack energy or feel tired	8 Low in energy
Cognitive disturbances		
Ideas of deprivation and loss	–	29 Feeling lonely
Low self-esteem and self-confidence	E12 feeling worthless	79 Feeling worthlessness
Self-reproach and pathological guilt	E12A feeling guilty	26 Blaming yourself
Helplessness, hopelessness, pessimism	–	22 Feeling trapped
		54 Hopeless about future
Thoughts of death and suicide	E18 thinking about death	59 Thoughts of death
	E19 thinking about committing suicide	15 Thoughts of ending your life
	E20 attempted suicide	
Vegetative disturbances		
Appetite/weight loss	E4 less appetite/E5 weight loss	19 Poor appetite
Appetite/weight gain	E6 larger appetite/E7 weight gain	–
Insomnia	E8 trouble sleeping	–
Hypersomnia	E9 sleeping too much	–
Circadian dysregulation	–	–
Seasonality	–	–
Sexual dysfunction	–	5 Loss of sexual interest

Adapted from Akiskal [42]

'–' Denotes symptoms in this subdomain not assessed by measurement instrument

from the CIDI and from the SCL-90-R by analyzing differential item functioning [1]. In this analysis the items are considered to be categorical indicators of an underlying latent factor ('depression'). According to the underlying psychometric model, subjects with a high value on this factor have a high probability of showing depressive symptoms. Overall differences between the three migrant groups and native Dutch subjects as reference group on this depression factor are taken into account as main affects. Subsequently, differential item functioning is tested by adding item-by-group interactions: is a specific item more or less often endorsed than might be expected from the depression factor score in any of the migrant groups in comparison with the reference group? We performed this analysis on the SCL-90-R items with the three migrant groups and native Dutch subjects as reference group. The analysis was repeated on CIDI items with the Turkish immigrant group and native Dutch subjects. As software package we used the Mplus program [32]. For both the CIDI symptoms and the SCL-90-R items a one-factor model was assumed. Main effects of age, sex and ethnic group on the overall CIDI factor score and the SCL-90-R factor score, respectively were included to control for overall differences between groups defined by each of these three background variables. Differential item functioning was performed by adding interaction terms for items and each of the background variables. Wald tests were used to test for the statistical significance of the item-interaction terms. The alpha level was corrected according to the Bonferroni method: In this way the alpha level for the analysis of the SCL-90-R depression subscale (16 items) was set to 0.00104 [0.05/(3 × 16)]. For the analysis of the depressive items in the CIDI the alpha level was set to 0.00098 [0.05/(3 × 17)].

Overall WHODAS II sum scores were compared between the four study groups by ANOVA. Using multiple linear regression analysis with the WHODAS II sum score as dependent variable, we analyzed subsequently the relation with current major depressive disorder (CIDI) and with the severity of depressive symptoms (SCL-90-R depression subscale sum score) as independent variables. In both analyses age, sex, depression score (CIDI last month depressive disorder or SCL-90-R depression sum score), migrant group and the interaction term for migrant group and depression score were included separately as covariates. To test our second hypothesis, the contribution of the interaction term was tested for significance.

Results

Sociodemographic and clinical characteristics of the sample

The distribution of age and sex was different in the three immigrant groups and native Dutch subjects (Table 2). This reflects both differences in the composition of the population of Amsterdam as well as differences in response rates. Most immigrants migrated from their country of origin as young adults. The majority of Turkish-Dutch and Moroccan-Dutch respondents had received primary education only, because they typically grew up in rural, underdeveloped areas of their countries of origin. In the Netherlands their level of integration is limited, which necessitated for the majority of respondents interviews in their native language. Social economic status (employment status, family income) was lower in all three immigrant groups compared to native Dutch subjects.

Current major depressive disorder was present in a high proportion of Turkish-Dutch respondents (Table 2). The age of onset (i.e., first major depressive episode) was equal in all groups. Because Turkish-Dutch and Moroccan-Dutch respondents are younger, this might influence the mean age of onset. After standardization for age we repeated the ANOVA with similar results ($F = 1.059$, $df = 178$, $P = 0.368$). On the SCL-90-R depression scale Turkish-Dutch subjects reported the highest scores, followed by Moroccan-Dutch, Surinamese-Dutch and native Dutch respondents (Table 2).

Comparison of depressive symptoms

The 16 separate depressive symptoms from the SCL-90-R were analyzed for differential item functioning between the

Table 2 Socio-demographic and clinical characteristics of the study sample

	Native Dutch ($N = 321$)	Turkish-Dutch ($N = 213$)	Moroccan-Dutch ($N = 191$)	Surinamese-Dutch ($N = 87$)	P
Mean age (SD)	54.1 (14.6)	47.3 (14.2)	49.6 (14.4)	52.3 (15.2)	<0.0001
Female sex	58.3%	60.1%	47.1%	71.3%	0.001
Mean age at immigration (SD)[a]	–	25.2 (10.4)	27.1 (10.2)	25.6 (15.4)	0.261
Second generation immigrant	–	7.5%	6.8%	10.3%	0.584
Education: none or primary only	19.7%	59.5%	60.9%	17.4%	<0.0001
Language preference: non-Dutch[b]	–	89.2%	68.3%	0.0%	<0.0001
Employment status: unemployed[c]	6.8%	25.2%	23.2%	11.1%	<0.0001
Gross family income ≤1,350€	31.0%	74.5%	79.7%	50.7%	<0.0001
CIDI major depressive disorder					
1-Month prevalence[d]	4.1%	16.5%	5.8%	1.1%	<0.0001
Age of onset (SD)[e]	36.3 (13.0)	33.5 (15.1)	35.3 (11.7)	42.7 (19.4)	0.168
SCL-90-R depression scale					
Sum score (SD)	20.9 (7.2)	30.1 (14.1)	26.2 (12.6)	23.0 (10.3)	<0.0001

P based on univariate ANOVA or Chi-square on dichotomous characteristics

SD standard deviation

[a] First generation immigrants only

[b] Language used during interview. For Turkish respondents native language is Turkish. For Moroccan respondents native language is Moroccan-Arabic or Berber language

[c] 'Not unemployed' includes people with paid jobs and students, housewives and retired elderly

[d] Prevalence in study population, not weighed by sex or age

[e] Age of onset of first major depressive episode

Turkish, Moroccan and Surinamese immigrant groups and the native Dutch reference group. The basic model revealed that Turkish-Dutch and Moroccan-Dutch respondents have higher depression scale scores than native Dutch subjects. In Table 2 this was already shown based on the SCL depression scale sum score. The basic model also revealed that women responded overall significantly higher. There was no significant effect of age, nor of interactions of sex and age with migrant group. As far as the loading of the interaction-terms item × sex on the underlying latent depression factor is concerned, only one item showed significant item bias: SCL-90-R item 20 (crying easily) loaded significantly higher in women than in men. Item 59 (thoughts of death) loaded significantly higher on the underlying depression factor in older respondents (positive item bias of interaction term item 59 × age). In the Surinamese immigrant group none of the symptoms showed significant ethnic differential item functioning. In the Turkish-Dutch group two items showed significant negative item effect: item 22 (feeling trapped) and item 31 (worrying too much), indicating that Turkish-Dutch respondents scored relative low on these items, given their overall depression score. In the respondents from Moroccan descent three symptoms showed significant positive item effect: 19 (poor appetite), 32 (feeling no interest) and 59 (thoughts of death), indicating that Moroccan-Dutch subjects responded more often on these symptom than might be expected, given their depression score.

The analysis of the 17 separate depressive symptoms from the CIDI in the Turkish-Dutch group and the native Dutch reference group showed that in the basic model migrant group, sex and age had no significant effects, nor had the interactions of these variables. Five symptoms showed significant differential item functioning. No differential item effect was found in interaction with sex or age. Four items showed a negative item bias in the Turkish-Dutch group: E2 (loss of interest), E12 (feeling worthless), E12A (feeling guilty) and E15 (trouble concentrating). One symptom showed positive item bias: E6/E7 (increase of appetite or weight).

To gain more insight in the characteristics of the symptoms with significant item effects, we summarized the results of the differential item functioning analysis of the CIDI and the SCL-90-R in Table 3. Our hypotheses that cultural differences would show most readily in the domains of cognitive evaluations or mood disturbances were not confirmed by our findings, as the symptoms which show item bias are scattered over the four domains. Thus, although the results on some depressive symptoms from the CIDI and the SCL-90-R differed in Turkish and Moroccan immigrant groups when compared to native Dutch subjects, this was not related to specific symptom domains.

Differences in association of depressive symptoms with general functioning

Results on the WHODAS II were available for 810 respondents (two missing cases). The highest levels of disability, expressed by the highest WHODAS II scores, were found in Turkish immigrants (mean 67.0, SD 26.4), followed by Moroccan immigrants (mean 57.6, SD 23.7), Surinamese immigrants (mean 55.8, SD 21.0) and Dutch subjects (mean 52.7, SD 16.2). Mean scores differed significantly between the four groups (ANOVA $F = 19.1$, $df = 3$, $P < 0.0001$). The six subscales were all strongly correlated with the WHODAS II total score (Pearson correlations ranging from 0.709 to 0.865; for all correlations $P < 0.0001$). Therefore no analyses were performed on the subscales.

The relation between the presence of a major depressive disorder in the last month (CIDI 2.1) and the WHODAS II sum score was assessed by means of a multiple regression analysis with the WHODAS II sum score as dependent variable. The Surinamese immigrant group was excluded from analysis, because of the small number of respondents with a diagnosis of depressive disorder. A model with age, sex, presence of depressive disorder, migrant group and the interaction term for migrant group and presence of depressive disorder as independent variables was highly significant ($F = 27.4$, $P < 0.0001$). After adjustment for age and sex, significant contributions were found for the presence of depressive disorder (F change $= 138.5$, $df = 1$, $P < 0.0001$) and migrant group (F change $= 20.5$, $df = 2$, $P < 0.0001$) with the WHODAS II sum score. The interaction term was not significant (F change $= 1.3$, $df = 2$, $P = 0.263$). So, although the baseline level of disability differed between ethnic groups, the strength of the relation of a current major depressive episode with the WHODAS II sum score was equal in native Dutch subjects, Turkish and Moroccan immigrants.

Overall the SCL-90-R depression sum score was strongly and positively correlated with the WHODAS II (Pearson $r = 0.716$, $P < 0.0001$), indicating that the level of disability increases with higher levels of depressive symptoms. The regression model with the WHODAS II sum score as dependent variable and age, sex, SCL-90-R depression sum score, migrant groups and the interaction term for migrant group and depression score as independent variables was highly significant ($F = 94.3$, $P < 0.0001$). After adjustment for age and sex, significant contributions were found for the SCL-90-R depression score (F change $= 832.7$, $P < 0.0001$), and for the three migrant groups (F change $= 2.7$, $P = 0.048$), but not for the interaction term of migrant group and SCL-90-R depression sum score (F change $= 0.311$, $P = 0.817$) with the WHODAS II sum score. This shows that the

Table 3 Differential item functioning of depressive symptoms in CIDI 2.1 and SCL-90-R; results categorized in four symptom domains

	CIDI 2.1	SCL-90-R		
	Turkish-Dutch	Turkish-Dutch	Moroccan-Dutch	Surinamese-Dutch
Mood disturbances				
Depressed mood	0	0	0	0
Anhedonia or loss of interest	*E2*	0	**32**	0
Psychomotor disturbances				
Movement	0	–	–	–
Neurocognitive	*E15*	*31*	0	0
Subjective	0	0	0	0
Cognitive disturbances				
Ideas of deprivation and loss	–	0	0	0
Low self-esteem and self-confidence	*E12*	0	0	0
Self-reproach and pathological guilt	*E12A*	0	0	0
Helplessness, hopelessness, pessimism	–	*22*	0	0
Thoughts of death and suicide	0	0	**59**	0
Vegetative disturbances				
Appetite/weight loss	0	0	**19**	0
Appetite/weight gain	**E6/E7**	–	–	–
Insomnia	0	–	–	–
Hypersomnia	0	–	–	–
Sexual dysfunction	–	0	0	0

See Table 1 for categorizations of items in symptom domains and for the content of the items

Item number **bold**: item shows significant higher differential item functioning than in native Dutch reference group

Item number in *italics*: item shows significant lower differential item functioning than in native Dutch reference group

0 Denotes none of the items of this subdomain show significant ethnic differential item functioning. '–' Denotes symptoms in this subdomain not assessed by measurement instrument

association between SCL-90-R depression sum score and WHODAS II sum score was equal in each of the immigrant groups compared to native Dutch subjects.

Discussion

In this population-based study in Amsterdam, the Netherlands, we studied the depressive symptom profile and the relation between depressive symptoms and functional impairments in native Dutch subjects and three immigrant groups from Turkey, Morocco and Surinam/the Netherlands Antilles.

For our first research question, the comparison of the depressive symptom profile, we studied both the depressive symptoms from the CIDI 2.1 and the depression subscale items from the SCL-90-R. We hypothesized that cultural differences between migrant groups and native Dutch subjects would be most prominent in the domains of mood symptoms and cognitive symptoms. Mood symptoms are generally difficult to verbalize and therefore readily expressed in local idioms of distress. The content of depressive cognitions, like guilt or shame, is shaped by the importance given to these themes by people's culture. On the other hand we hypothesized psychomotor and vegetative symptoms to be comparable across migrants groups and native Dutch subjects, as these symptoms can be assumed to reflect the biological features of the depressive disorder. Our results did not confirm these hypotheses. The symptom profiles were very similar among the four groups. Exceptions detected by differential item functioning analysis occurred in all four domains of symptoms.

These findings substantiate results from earlier epidemiological studies. In one of the first WHO-initiated cross-cultural epidemiological surveys, in which depressive disorder was assessed by the Schedule for Standardized Assessment of Depressive Disorders (SADD), it was concluded that patients from four countries (Canada, Iran, Japan, Switzerland) exhibited the same 'core' of depressive symptomatology, including mood symptoms [34, 48]. Other cross-cultural studies confirmed the equivalence of depressive symptoms in different countries or migrant groups [15, 20, 38, 45].

While our study focused on the supposed underreporting of mood symptoms in lower-educated non-Western migrants, many studies investigated the twin phenomenon

of 'somatization'. Depressive patients in non-Western cultures are described to express their mood disturbances by means of somatic complaints. As Simon et al. [37] outline, the term 'somatization' refers to at least three different definitions: First, presentation with somatic symptom; second, the association between depression and medically unexplained symptoms; and third, denial of psychological distress and substitution of psychological distress with somatic symptoms. Both from cross-national studies [37] and from studies in immigrant populations [29] evidence converges that patients may present with somatic symptoms, but will acknowledge psychological distress when asked specifically [13, 25]. Specifically, this conclusion has been corroborated in Turkish citizens in Istanbul [44], Turkish immigrants in Germany [17] and Turkish immigrants in the Netherlands [40].

Our finding of comparable recognition of cognitive symptoms by non-Western study groups has also been affirmed in previous clinical–epidemiological studies. Even a taboo-laden cognition like suicidal ideation has been described in different cultures and countries, amongst others in Morocco [2, 31]. Potential cultural-influenced themes as guilt also appear to be rather a universal than a (Western-Christian) culture-bound theme [13, 44].

Secondly, we studied the relation of a diagnosis or symptoms of depressive disorder with general functioning in the three immigrant groups and native Dutch subjects. A strong relation between mental health and WHODAS disability scores has been demonstrated in a variety of countries, among which the United States [23], European countries [7] and Korea [24]. We hypothesized that, due to a lower threshold in reporting symptoms, in immigrant groups depressive symptoms are associated with less disability than in native Dutch subjects. Contrary to our expectations, our results revealed no differences between immigrant groups and native Dutch subjects. In all groups we found an equal association between the presence of a depressive disorder in the last month (assessed by the CIDI) or the level of depressive symptoms (measured by the SCL-90-R depression subscale) and the level of disability (measured by the WHODAS II). These findings suggest comparability of the diagnosis of depressive disorder as measured by the CIDI and the assessment of severity of depression by the SCL-90-R depression subscale in these migrant groups.

As published in an earlier paper in this journal, based on the same survey, the prevalence of depressive disorders is higher in Turkish immigrants then in native Dutch subjects; in Moroccan male immigrants the same trend was observed [46]. Ethnic differences in prevalence could not be explained by socioeconomic differences. de Wit et al. [46] discuss possible other explanations like selective migration, impact of migration-history or adverse experiences in their actual migrant-status, like a clash of values with the host-society, experiences of discrimination and a lack of social support. The findings of the present study show that the ethnic differences in prevalence and severity of depression cannot be explained by another 'type' or a less disabling form of depressive disorder.

Several limitations in the present study should be acknowledged. The first limitation of this study lies in the use of standard clinical measurement instruments (CIDI, SCL-90-R). Culture-bound symptoms that are not part of these instruments may be ignored as potential meaningful symptoms of depressive disorder [22, 39]. There is a need to explore alternative symptoms and diagnostic criteria by means of qualitative research in addition to quantitative epidemiological surveys. At the same time, studies with standard clinical instruments in non-Western (immigrant) populations facilitate the incorporation of cross-cultural research in the existing body of knowledge on psychiatric disorders [10]. We have chosen to explore depressive symptoms in non-Western immigrant groups in the Netherlands using internationally accepted en validated instruments as a starting point. In all we investigated thirty-three symptoms, covering four domains of depressive disorder. The Turkish-Dutch and Moroccan-Dutch subjects in our study reported the highest numbers of symptoms. This shows that they recognized these items, although it does not exclude underreporting of symptoms. In order to reduce misunderstandings due to language problems to a minimum, we used official translations of the questionnaires when available, or put extensive effort in translation. The measurement instruments were administered by extensively trained bilingual interviewers during home visits.

Secondly, we observed in both phases of the study selectivity in response rates with respect to age, gender and ethnicity. This might influence our findings if this differential response has resulted in selection of migrants with a higher (or lower) level of acculturation in the final study sample. In the first phase of the sampling, first-generation immigrants were more likely to respond to the general health survey than second-generation immigrants. Responders and non-responders to the second phase of the study with the more detailed assessment of mental health did not differ significantly in first/second generation migrant status, nor in level of acculturation as assessed in the first phase. The final study sample of Turkish-Dutch and Moroccan-Dutch respondents consisted mainly of low-educated, first-generation immigrants, who preferred to be interviewed in their native language. Therefore the results might tend to be biased towards finding more differences in symptom profile between the migrant study groups and the native Dutch study group. In this light our finding of the absence of systematic differences in symptom profile in the migrant groups is even more remarkable.

Thirdly, we cannot exclude the possibility that the structure of the CIDI interview has influenced our results.

According to the standard instructions, the complete CIDI interview has only been administered to respondents who affirmed at least one of the two questions on sadness or loss of interest (in lifetime), both questions on mood symptoms. Underreporting of these two mood symptoms by respondents of Turkish and Moroccan cultural background cannot be excluded [39]. The number of Moroccan-Dutch and Surinamese-Dutch respondents who affirmed one of the stem questions and subsequently answered the complete CIDI depression section was insufficient for further statistical analysis. Therefore, we performed the differential item functioning analysis on the CIDI data only for the native Dutch respondents ($N = 163$, 50.8% of all native Dutch respondents) and the Turkish-Dutch respondents ($N = 119$, 55.9% of all Turkish-Dutch respondents). Turkish-Dutch respondents answered less often positive on the question on loss of interest (E2) than native Dutch respondents (Table 3). However, there was no difference in Turkish-Dutch and native Dutch respondents in their answer on this question in the SCL-90-R (item 32). Interestingly, the differential item functioning analysis of the SCL-90-R depressive symptoms in the Moroccan-Dutch study group showed no underreporting of mood symptoms, but even an over-reporting of 'feeling no interest' (item 32).

A strong point of the present study is that it is community based, including a representative sample of the main immigrant groups in Amsterdam.

Conclusion

Turkish, Moroccan and Surinamese immigrants and native Dutch subjects reported in this population study in Amsterdam, the Netherlands, comparable depressive symptoms in four domains: mood, cognitive, psychomotor and vegetative disturbances. Also, the relation of depressive symptoms with functional impairments was equal in immigrants and native Dutch subjects. This study supports the use of standardized diagnostic instruments to assess depressive symptoms in non-Western immigrant patients.

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